Space Weather Forecast

Issued on Sunday, 17 July 2022 at 01:20 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate X-ray flares likely throughout. Chance of Minor Geomagnetic Storms towards end of period.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is Moderate with X-ray flares peaking at moderate class at 16/0629UTC and 16/1539UTC. There are now nine regions on the visible disc. Five of these are currently large and mature sunspots. A Coronal Mass Ejection (CME) from a filament eruption at 15/1300UTC is due to arrive around the turn of the UTC day Tuesday 19 July into Wednesday 20 July. Another large filament that lifted from the southwest quadrant later in the day of 16 July has still to be analysed for a Earth-bound CME component.

Solar Wind / Geomagnetic Activity: The solar wind has been elevated over the past 24 hours as a result of a waning 'coronal hole' high speed stream. The number of particles comprising the wind was mostly near average. The magnetic field associated with the particles was weak as was the field in the important northwards/southwards direction. The net result of the above solar wind measures was nevertheless provisionally quiet.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is Likely to be moderate, with a daily slight chance of strong-class flares. Two of the current large sunspots should leave the Earth-facing side of the Sun into the new week, resulting in a slight reduction in flare probability. Arriving bright flux over the eastern solar horizon may signify arriving sunspots which could compensate for any loss.

Solar Wind / Geomagnetic Activity: The 15/1300UTC 'filament' CME is due at the very end of the current forecast period, around the turn of the UTC day Tuesday 19 into Wednesday 20 July. Two fast wind streams may feature in the forecast: firstly an exit from the long-peaked current high speed stream; and secondly minor influence from a smaller, less intense feature on day three (Tuesday 19 July). Quiet geomagnetic activity is anticipated before becoming Unsettled to Active with a chance of Minor Storm G1 on day three (Tuesday 19 July) from the combined effect of the 15 July CME mentioned above, and any concurrent high speed stream. The slow speed of the assessed CME and the prospect of a second one along a similar track (TBC) may result in the risk of G1 extending through midweek UTC before easing.

Energetic Particles / Solar Radiation: There remains a daily slight chance of S1 or greater solar radiation storms due to the presence of large sunspot regions in the better-connecting (with Earth) central and western portions of the Sun.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	40	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	65	65	50	40
Very Active	R3 to R5 X	No	10	10	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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